



# ICAO ENGINE EXHAUST EMISSIONS DATA SHEET

## SUBSONIC ENGINES

ENGINE IDENTIFICATION: Trent7000-72 BYPASS RATIO: 9.1  
 UNIQUE ID NUMBER: 04P24RR146 PRESSURE RATIO ( $\pi_{co}$ ): 44.6  
 COMBUSTOR: Phase5 Tiled (Improved nvPM combustor)  
 ENGINE TYPE: TF RATED THRUST ( $F_{oo}$ ) (kN): 327.9

### REGULATORY DATA

CHARACTERISTIC VALUE:	HC	CO	NO <sub>x</sub>	SMOKE NUMBER
$D_p/F_{oo}$ (g/kN) or SN	0.0	10.2	68.0	11.0
AS % OF ORIGINAL LIMIT	0.0	8.6	52.6	64.3
AS % OF CAEP/2 LIMIT (NO <sub>x</sub> )			65.8	
AS % OF CAEP/4 LIMIT (NO <sub>x</sub> )			70.7	
AS % OF CAEP/6 LIMIT (NO <sub>x</sub> )			77.1	
AS % OF CAEP/8 LIMIT (NO <sub>x</sub> )			85.7	

For non-volatile particulate matter (nvPM) emissions, please refer to the ICAO Engine nvPM Emissions Data Sheet.

### DATA STATUS

- PRE-REGULATION  
 x CERTIFICATION  
 - REVISED (SEE REMARKS)

### TEST ENGINE STATUS

- NEWLY MANUFACTURED ENGINES  
 x DEDICATED ENGINES TO PRODUCTION STANDARD  
 - OTHER (SEE REMARKS)

### EMISSIONS STATUS

x DATA CORRECTED TO REFERENCE  
 (ANNEX 16 VOLUME II)

### CURRENT ENGINE STATUS

(IN PRODUCTION, IN SERVICE UNLESS OTHERWISE NOTED)  
 - OUT OF PRODUCTION (DATE: - )  
 - OUT OF SERVICE (DATE: - )

### MEASURED DATA

MODE	POWER SETTING (% $F_{oo}$ )	TIME (minutes)	FUEL FLOW (kg/s)	EMISSIONS INDICES (g/kg)			SMOKE NUMBER
				HC	CO	NO <sub>x</sub>	
TAKE-OFF	100	0.7	2.477	0.00	0.31	53.08	6.6
CLIMB OUT	85	2.2	2.024	0.00	0.50	40.08	8.8
APPROACH	30	4.0	0.667	0.00	0.79	15.07	4.2
IDLE	7	26.0	0.256	0.00	6.99	6.06	1.7
LTO TOTAL FUEL (kg) or EMISSIONS (g)			931	0	3087	21064	-
NUMBER OF ENGINES				3	3	3	3
NUMBER OF TESTS				5	5	5	5
AVERAGE $D_p/F_{oo}$ (g/kN) or AVERAGE SN (MAX)				0.0	9.4	64.2	10.0
SIGMA ( $D_p/F_{oo}$ in g/kN, or SN)				0.0	1.3	1.6	1.6
RANGE ( $D_p/F_{oo}$ in g/kN, or SN)				0.0	8.36-10.87	63.17-66.1	8.6-11.7

### ACCESSORY LOADS

POWER EXTRACTION 0 (kW) AT - POWER SETTINGS  
 STAGE BLEED 0 (% CORE FLOW) AT - POWER SETTINGS

### ATMOSPHERIC CONDITIONS

BAROMETER (kPa)	100.2-101.6
TEMPERATURE (K)	291.4-299.6
ABS HUMIDITY (kg/kg)	0.00473-0.00986

### FUEL

SPEC	
H/C	1.94
AROM (%)	15.76

MANUFACTURER: Rolls-Royce plc  
 TEST ORGANIZATION: Rolls-Royce plc  
 TEST LOCATION: Derby  
 TEST DATES: 06/05/2020-26/08/2020

### NO<sub>x</sub> REGULATION PARAGRAPH

	2.3.2 c) (CAEP/4)
	2.3.2 d) (CAEP/6)
x	2.3.2 e) (CAEP/8)

### REMARKS

- EDNS01000945619
- Improved nvPM combustor

Compliance with Fuel Venting requirements:

x ('x' if complies, 'PR' if pre-regulation, '- ' if information is not available)